NEW YORK STATE DEPARTMENT OF TRANSPORTATION
MATERIALS BUREAU ALBANY, NY 12232

MATERIALS METHOD

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SUBJECT: QUALITY ASSURANCE PROGRAM FOR PLAIN, STEEL LAMINATED, FABRIC LAMINATED AND SLIDING ELASTOMERIC BRIDGE BEARINGS

APPROVED: James J. Murphy

CODE: 7.42-1

I. Scope

This method describes specific procedures for the quality assurance of elastomeric bridge bearings manufactured for Department projects. It encompasses a strict control system whereby only those bearings designed and therefore designated for specific projects are inspected, sampled and tested for eventual shipment to that project.

Bridge bearings with a design plan area of 650 square inches or less will be considered for acceptance strictly in conformance with the details of this procedure. Bearings designed with a plan area greater than 650 square inches will also be considered as detailed in this procedure except that some of the testing may be performed by a laboratory designated and approved by the Department, rather than by the Materials Bureau.

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III. Definitions

A. Manufacturer
A company actually engaged in the production of elastomeric bearings at a given location.

B. Department
The New York State Department of Transportation.

C. Deputy Chief Engineer (Structures)
An official of the Department of Transportation who may be contacted by mailing to:

Deputy Chief Engineer (Structures)
New York State Department of Transportation
Building #5 - State Campus
1220 Washington Avenue
Albany, N.Y. 12232

or by telephoning (518) 457-6825.

D. Materials Bureau
A facility of the New York State Department of Transportation which may be contacted by mailing to:

Director, Materials Bureau
New York State Department of Transportation
Building 7A - Room 200
1220 Washington Avenue
Albany, New York 12232

or by telephoning the Materials Administration Office of the Materials Bureau at (518) 457-5642.

E. Inspection Authority
An office designated by the Materials Bureau as responsible for inspection control on behalf of the Department at specific manufacturing locations.

F. Plant Inspector
An individual employed by the Inspection Authority and approved by the Materials Bureau to function on inspection assignments in behalf of the Department.

G. Plain Elastomeric Bridge Bearing
A bearing composed entirely of elastomeric material cast in a mold under pressure and heat. A bearing may also be cut from a larger piece of elastomeric material. Any external load bearing steel plate(s) shall be factory vulcanized to the elastomeric bearings during the primary molding process.

H. Steel Laminated Elastomeric Bridge Bearings
A bearing composed of multiple laminates of elastomeric material separated by steel plates. The bearings shall be cast as a unit or cut from a larger section that has been cast as a unit in a mold under pressure and heat. The steel plates separating the elastomeric layers shall be completely bonded by vulcanization to the elastomeric material on all surfaces. Any external load bearing steel plate(s) shall be factory vulcanized to the elastomeric bearings during the primary molding process.

I. Fabric Laminated Elastomeric Bridge Bearings
A bearing composed of multiple laminates of elastomeric material separated by fabric sheets. The bearings shall be cast as a unit or cut from a larger section that has been cast as a unit in a mold under pressure and heat. The fabric sheets separating the elastomeric layers shall be completely bonded by vulcanization to the elastomeric material on all surfaces. Any external load bearing steel plate(s) shall be factory vulcanized to the elastomeric bearings during the primary molding process.

J. Sliding Elastomeric Bridge Bearing
A bearing consisting of a plain or steel laminated elastomeric element bonded to a lower steel bearing plate. To allow movement, the upper surface of the element shall be faced with a steel backed, polytetrafluoroethylene (PTFE) sheet and support a sliding top bearing plate. The mating surface of the top steel bearing plate shall be faced with polished stainless steel.

K. Lot
One or more bearings of the same item and size manufactured in a reasonably continuous manner in accordance with Department approved drawings.

L. Forms
The following forms are published by the Department for use by the Materials Bureau and Inspection Authorities.

1. BR-240 Sample and Acceptance Transmittal
   This form transmits the inspector's sample information to the Materials Bureau and, upon validation, conveys acceptance/rejection action to the inspector. Detailed instructions for proper completion and transmittal are contained in Materials Method N.Y. 18.1.

2. BR-241, Transmittal Envelope
   This is a heavy duty envelope used to contain the BR-240.

NYSDOT
Library
50 Wolf Road, POD 34
Albany, New York 12232

3. BR-195, Shipment Authorization
This form, executed by the inspector, accompanies all shipments by the supplier to the project. Detailed instructions for proper completion and transmittal are contained in Materials Method N.Y. 18.2.

M. Seals
Red tape seals imprinted "N.Y.S. D.o.T. Sampled" are used to provide security of packages containing samples submitted to the Department.

IV. Evidence of Acceptability

A. At the Manufacturing Plant
Appropriate copy of Form BR-240 in the possession of the Inspector, properly noted with the word "accepted" and validated by the Materials Bureau.

B. At the Project Site

1. Buff copy of Shipment Authorization Form BR195 with each delivery.
2. A validated green copy of Form BR-195 subsequent to the delivery.
3. Double Inspection Authority Stamp or one Inspection Authority Stamp with one "NYS DoT Accepted" stamp on each unit.

V. Drawing Approval & Inspection Assignment

Responsibility	Action
Contractor	A. Submits to Deputy Chief Engineer (Structures) triplicate prints of preliminary shop drawings, drawn by the bearing manufacturer in accordance with the contract documents.
Deputy Chief Engineer (Structures)	B. Reviews the working drawings and returns one print to the manufacturer with approval or the required corrections indicated thereon.
Manufacturer	C. Makes the necessary corrections as indicated and when completed forwards the original tracing to the Deputy Chief Engineer (Structures).

Responsibility	Action
Deputy Chief Engineer (Structures)	D. Reviews the completed tracing and if acceptable returns an approved print to the manufacturer for further distribution. (If unacceptable the tracing will be returned to the manufacturer for correction.)
Manufacturer	E. Transmits one paper print copy of the approved drawing to the Materials Bureau.
Manufacturer	F. Transmits two paper prints and one vellum reproducible of the approved drawing to the Department's Region office of project jurisdiction.
Materials Bureau	G. Assigns an Inspection Authority and forwards copies of the approved drawings to them with a letter detailing the specific bearing item(s) required.
Inspection Authority	H. Makes preliminary contact with the manufacturer.
	I. Schedules an inspection visit.
	J. Assigns an inspector to make the visit.
Inspector	K. Reviews the specification(s) and Quality Assurance procedure prior to an inspection visit. Questions should be directed to the Materials Bureau at (518) 457-5642.

VI. Inspection

The inspector shall have in his possession the letter assigning the inspector to perform Department inspection, the Department approved drawings, the specification and this Materials Method. The above references shall be utilized by the inspector in performing the required inspection services.

Responsibility	Action
Manufacturer	A. Manufactures all bearings to be included in a lot to be considered for Department acceptance.
	B. Arranges for a clean, well lighted location, at the manufacturing site for the inspector to evaluate all of the bearings to be considered for acceptance by the Department.

Responsibility	Action
Manufacturer	C. Maneuvers the bearings as required by the inspector to provide easy access for all measurements to be made.
	D. Identifies indelibly each bearing on the side with the following minimum information. 1. Manufacturer's name 2. Department Contract Number D_____ 3. Lot number - the manufacturer shall start with lot number 1 and number consecutively throughout the Calendar year. 4. Each individual bearing in the lot shall be numbered individually 1 through ___.
	E. Prepares copies of the following certifications to give to the Inspector to accompany the samples selected by the inspector. 1. All steel, both external and internal indicating conformance to Department requirements. 2. A statement as to the domesticity of the steel as follows. Domestic - Conforms to NYS EB 83-10 OR Foreign - Does not conform to NYS EB 83-10. 3. For sliding elastomeric bearings only: A statement from the manufacturer indicating sample sheets of Polytetrafluoroethylene (PTFE) and elastomer was from the same batch of material as used in the actual production of the bearings.
	F. Determines that all bearings to be included in a lot have been manufactured and are present to inspect. Bearings not presented for inspection at this time are not to be included in this lot, even though they may be of the same size and shape; they will be considered as a separate lot(s) when presented for inspection.
Inspector	G. Measures, records and evaluates the gross dimensions of each bearing and the external load plates as detailed on the approved drawing.

Responsibility	Action
Inspector	H. Measures and records the flatness of each sole (top) and masonry (bottom) plate utilizing the method as detailed on pages 12 & 13.
	I. Determines the parallelism of the fabric reinforcement or internal steel plates and individual layers of elastomer in accordance with the procedure as detailed on pages 14-16.
	J. Checks bearings to determine the manufacturer has identified each bearing as required by the specification.
	K. Places one inspection agency stamp on each bearing adjacent to the manufacturer's identifiers. This stamp will signify the bearings have been inspected.
	L. Notifies the Materials Bureau by telephone and the manufacturer when dimensions, including parallelism and laminate thicknesses do not meet Department requirements.
Materials Bureau	M. Upon receipt of a telephone call from the inspector detailing deficiencies when they occur a decision will be made to either reject the bearings or continue with the procedure and our evaluation of the bearings.
Inspector	N. Prepare a written report detailing the gross dimensions, laminate thickness and parallelism of all the bearings evaluated.
Inspection Agency	O. The detailed written report is transmitted to the Materials Bureau within one working day from the date of inspection.

VII. Sampling and Testing

The sampling and testing procedures detailed below shall be performed in their entirety for bridge bearings of 650 square inches plan area or less. The sampling and testing procedures for bridge bearings of a plan area greater than 650 square inches will be conceptually the same as detailed below. The testing location however is subject to change.

The contractor shall notify the Materials Bureau of his intention to supply bridge bearings in excess of a 650 square inch plan area and request the Department's quality assurance procedure for those bearings.

Note: One sample bearing from each lot of Plain Elastomeric Bridge Bearings and Fabric Laminated Elastomeric Bridge Bearings will be destroyed during testing to determine specification compliance.

One sample bearing from each lot of Steel Laminated Elastomeric Bridge Bearings with bonded top and bottom load plates will be destroyed if a sample size of elastomer equivalent to twelve (12) 1" x 6" x 1/8" thick pieces cannot be removed from the sides of the sample bearings for evaluation.

The manufacturer shall allow for the above destructive testing in his production.

Responsibility	Action
Inspector	A. Selects samples at the rate detailed in the specific item of the Standard Specifications (a tabulated summary of the specified number of sample bearings is shown on page 17). The samples shall be selected by using the random number table found on page 27.
	B. Completes Form BR-240, Sample and Acceptance Transmittal in accordance with Materials Method N.Y. 18.1: Examples of completed Form BR-240 are shown on pages 24 & 25. (Take special note of the example for Elastomeric Sliding Bearings Figure G which includes samples of PTFE and Elastomer.)

Responsibility	Action
Inspector	C. For Elastomeric Sliding Bridge Bearings, obtains from the manufacturer the following sheets representing material incorporated in the bearings. 1. One sheet of elastomer 10" x 15" (3/8" min., thickness) representing each lot. The manufacturer shall supply a certification indicating that the sample sheet was from the same batch of material as used in the actual production bearings. 2. One sheet of Polytetrafluoroethylene (PTFE) 10" x 15" of the thickness used on each lot of bearings. When PTFE of more than one thickness is used, a separate 10" x 15" sheet will be required for each thickness. The manufacturer shall supply a certification indicating the sample sheet(s) was from the same batch of material as used in the actual production bearings.
Manufacturer	D. Securely packages the samples with the BR-240's enclosed in the BR-241 envelope and ships to the Materials Bureau at the expense of the Contractor. Note: The packages containing the Elastomer and PTFE for Sliding Elastomeric Bearings shall be sealed by the inspector with Department tape seals.
Materials Bureau	E. Performs the required tests
	F. Determines appropriate action based on the results of the required tests.

VIII. Acceptance/Rejection Action

Responsibility	Action
Materials Bureau	A. Executes appropriate action on Form BR-240.

Responsibility	Action
Materials Bureau	B. Issues validated Form BR-240 to the Inspection Authority as described in Materials Method N.Y. 18.1. 1. Telephone request to the Materials Bureau in advance of normal notification will be only honored when received from the Inspector. C. Identifies accepted bearings by stenciling "NYS DoT Accepted" adjacent to the Inspection Agency Stamp. D. Holds rejected bearings until disposition is requested by the manufacturer. All shipments of these bearings will be at the manufacturer's expense.
Inspection Authority	E. Receives validated copies of Form BR-240 and notifies the manufacturer of Department action.
Inspector	F. Each bearing accepted by the Department represented by the samples tested by the Materials Bureau shall be stamped with a second Inspection Agency stamp adjacent to the first. G. When the inspector informs the manufacturer that bearings have been rejected, no further action is required by the Inspection Agency.

IX. Shipping

The manufacturer shall not ship bridge bearings prior to acceptance by the Department. All shipments will be made as follows:

Responsibility	Action
Inspector	A. Completes a Form BR-195, "Shipment Authorization" in accordance with Materials Method N.Y. 18.2 authorizing shipment of the balance of the bearings to the project site. (See Example, Figure I, page 26.)

Responsibility	Action
Manufacturer	B. Notifies the Materials Bureau of the address to ship the accepted bearings which are in the possession of the Materials Bureau as test samples.
	C. Ships the bearings accompanied with the buff (card) copy of Form BR-195.
Materials Bureau	D. Completes a Form BR-195 "Shipment Authorization" to the project site as designated by the manufacturer and ships the sample bearings at the Contractor's expense.
	E. Validates copies of Form BR-195 completed by the inspector and Materials Bureau to the Region office of project jurisdiction.

Measuring Flatness of Steel Plates For Bridge Bearings

SCOPE: This method describes the specific procedure for measuring flatness of external steel plates for bridge bearings.

APPARATUS:

1. A precision straight edge, at least 1" longer than the dimension to be checked.

2. A feeler gauge capable of readings to the nearest 0.001". Note: Because "layering" of shim type feeler gauges tends to distort accuracy, a single blade shall be used whenever possible.

PROCEDURE:

1. Place the plate to be measured on a flat surface, uniformly supported, with the surface to be checked in a horizontal position. (Complete bridge bearing assemblies are considered to meet this requirement).

2. Plates shall be checked for flatness at the approximate center lines and also 1" from and parallel to, each outside edge, a total of six positions. The dotted lines in Figures A & B show where the straight edge shall be held.

3. Position the straight edge as parallel to the central axis of the plate as possible. On a surface with a raised center, it will be necessary to temporarily shim the straight edge for stability. See Figure B.

4. Hold the blade of the straight edge perpendicular to the surface at the predetermined locations, with adequate pressure to hold it in position. Attempt to slide the desired blade of the feeler gauge between the surface being measured and the straight edge, along the entire length of the piece. On sole plates, the areas within 1" of the edges parallel to the center line of the girder will not normally be in bearing and need not be checked. (Figure "A"). Check drawings if in doubt. Masonry plates will be checked across the entire area.

5. If the specified blade thickness will freely slide under the straight edge at any location, the inspector shall notify the manufacturer of the "out of flat" condition and the Materials Bureau to request the appropriate action. The results of testing shall be included in the written report transmitted to the Materials Bureau (include actual out of spec measurements).

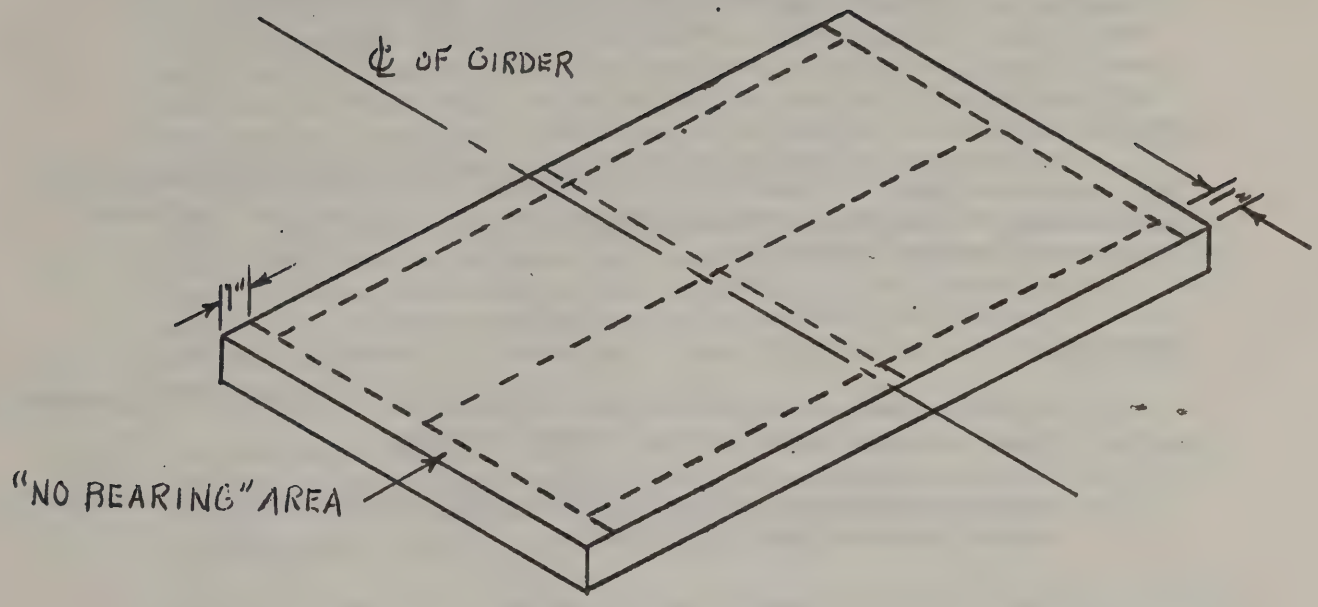


FIGURE "A", SOLE PLATE

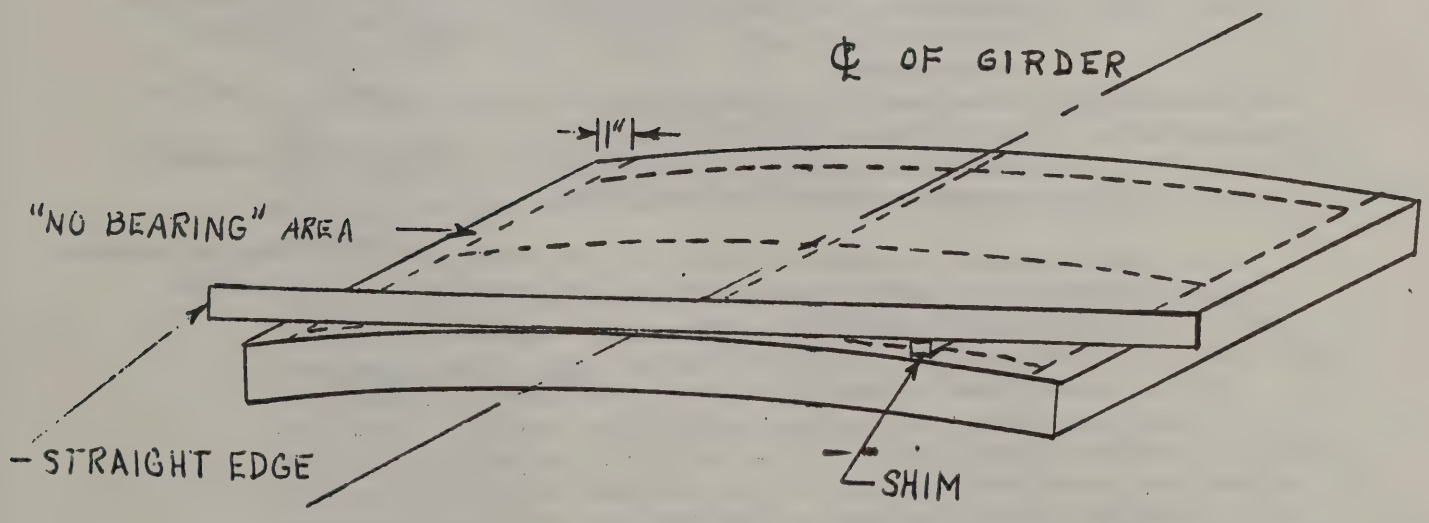


FIGURE "B" SOLE PLATE

Measuring Laminate Thickness and Parallelism For Bridge Bearings

SCOPE:

This procedure shall be used for determining the laminate thickness and parallelism of internal steel plates or fabric, of steel or laminated elastomeric bridge bearings.

APPARATUS:

1. A device such as a grinder used to remove thin strips of elastomer from the edge cover of the bridge bearings.

2. Calipers graduated to 0.01 inches and/or dividers and a machinist's scale graduated to 0.01 inches.

PROCEDURE:

1. Locate the shape factor, effective rubber thickness (ERT) and individual laminate thicknesses on the shop drawings as approved by the Deputy Chief Engineer (Structures).
   A. The shape factor must be 12.0 or less to utilize this procedure. If the shape factor is greater than 12.0, the inspector shall call the Materials Bureau for further instructions.
   B. Calculate 75% of the Effective Rubber Thickness (ERT) to determine specification limits.
   C. Calculate ± 20% of the individual laminate thicknesses to determine specification limits.

2. The inspector randomly selects the required number of sample bearings by using the random number table found on page 27. The sample schedule is as follows:

Lot Size	Number of Samples
1-4	All
5-16	4
17-20	5
21-24	6
25-28	7
29-32	8
33-36	9
37-40	10
41 or greater	1 additional bearing for every 4 in the lot

Note: Whenever possible, the bearings sampled for parallelism and laminate thickness measurements shall not be included in the random selection of bearings submitted to the Materials Bureau for testing. The sampling rate for bearings submitted to the Materials Bureau is as detailed in the Standard Specifications for the appropriate item.

3. For Steel Laminated Bridge Bearings ONLY, the manufacturer grinds off or removes a thin strip of elastomer along the vertical surface of the bearing at four points located 90° apart about the perimeter. For rectangular bearings this will be the midpoint of each side exposing the internal steel plates through the bearings thickness. The ground strip shall be as narrow as possible to minimize the exposure of the steel plates, yet wide enough to accurately locate the plates and measure the laminate thickness between them.

   Note: For small size bearings or small lots (i.e. 4 bearings or less) care should be taken to preserve an area on one bearing of at least 6 inches in length by the full bearing thickness such that a sample of elastomer can subsequently removed for testing by the Materials Bureau. If necessary, the grinding of one side of the bearing may be omitted.

4. The inspector measures and records the thickness of each elastomeric laminate at the four quarter-point perimeter locations. Vernier calipers or dividers and a machinist scale shall be used and measurements recorded to the nearest 0.01".

   For steel laminated bearings, the thickness of the elastomer shall be measured between the individual steel laminates or between the top or bottom edge of the bearing to the first adjacent steel laminate. (See examples 1 and 2 pages 19 and 20). For fabric laminated bearings, the thickness of the elastomer shall be measured from the approximate midpoint of the double ply fabric to the midpoint of the next adjacent double ply fabric laminate or the top or bottom edge of the bearing to the midpoint of the first double ply fabric laminate. (See examples 3 and 4 pages 21 and 22.)

   Note: Only working laminates will be evaluated to determine the parallelism of the internal steel plates and fabric reinforcement. Occasionally a bearing is designed with a bedding layer that is not a working laminate and therefore should not be included in the evaluation.

   Bedding layers can be identified by refering to the Department approved drawings. The bedding layer when included, will be the outermost layer (top, bottom or both). To determine if those layers are bedding layers, total the thickness of all layers of the elastomer as shown on the drawings rounding the sum off to the nearest 0.01 inches. If the total is equal to the Effective Rubber Thickness (ERT) as detailed on the drawing all layers are working laminates and shall be included in the parallelism determination. When the sum is greater than the ERT subtract the thickness of one or both of the outermost layers to determine which should be deleted to evaluate only working laminates.

   Should the inspector have any questions on a specific bearing pad of working laminate versus bedding layer, please contact the Materials Bureau at (518) 457-5642.

5. For determining the parallelism of steel plates and fabric reinforcement, the inspector will record the smallest measured thickness of each layer from the four quarter point locations which is defined as the working laminate thickness and proceed as follows:
    a. Determine the sum of the working laminate thickness for each bearing evaluated.
    b. The total working laminate thickness shall be equal to or greater than 75% of the ERT.
    c. If the total is less than 75% of the ERT, the inspector shall notify the Materials Bureau immediately requesting appropriate action. (See Examples 2, page 20.)

6. For determining the laminate thickness, the inspector will calculate the average of the four measurements for each laminate and proceed as follows:

    a. Compare the average thickness with the laminate thickness detailed on the approved drawing applying a ± 20% tolerance.
    b. If the average exceeds the ± 20% tolerance, the inspector shall notify the Materials Bureau immediately requesting the appropriate action. (See Example 4, page 22.)

7. Record and report all individual measurements and calculations to the Materials Bureau. (See Examples 1-4 on pages 19-22.)

Samples Required for Materials Bureau Testing

Item	Sample
716-02, Plain Elastomeric Bridge Bearings	Three (3) full size bearings per size per contract.
716-04, Steel Laminated Elastomeric Bridge Bearings	One (1) full size bearing per every five in each size category, per project, per production run, a minimum of three (3) bearings.
716-08, Elastomeric Sliding Bridge Bearings	One (1) full size bearing per every five in each size category, per project, per production run, a minimum of three (3) bearings. One 10" x 15" (3/8", minimum thickness) sheet of elastomeric material per project, per production run. One 10" x 15" sheet of PTFE material per project per production run.
716-10, Fabric Laminated Elastomeric Bridge Bearings	One (1) full size bearing per every five in each size category, per project, per production run, a minimum of three (3) bearings.

Example of Steel Laminated and Fabric Laminated
Bridge Bearings

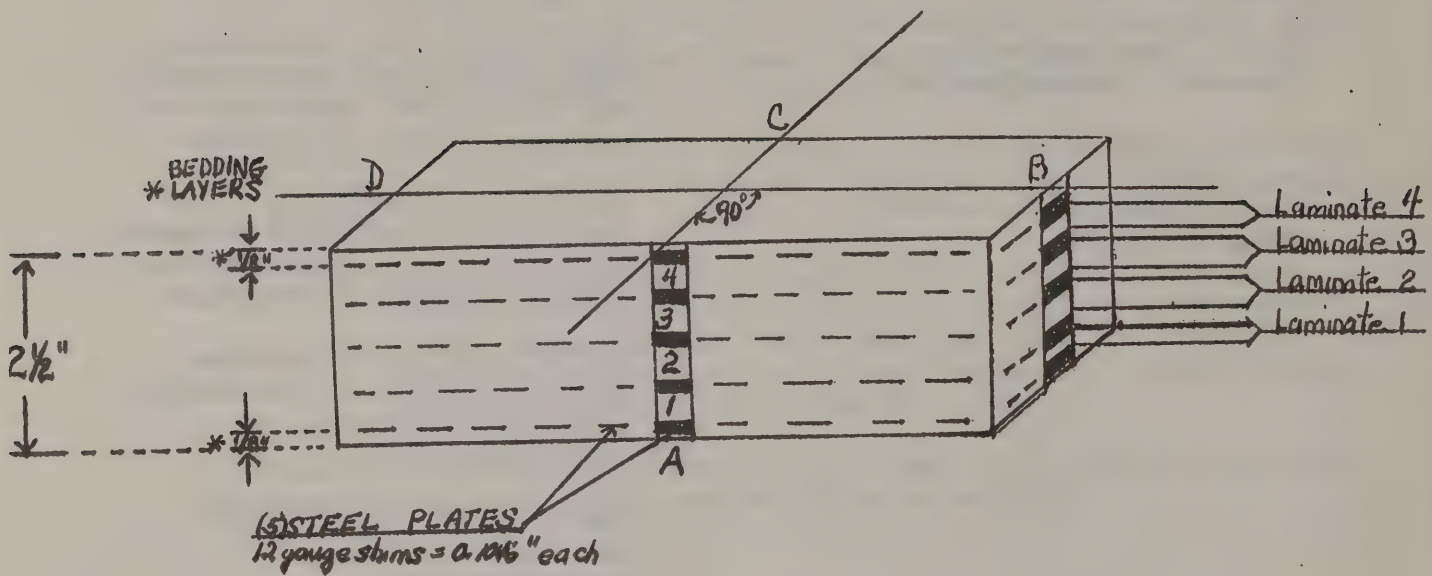


Figure C
Steel Laminated Elastomeric Bridge Bearing

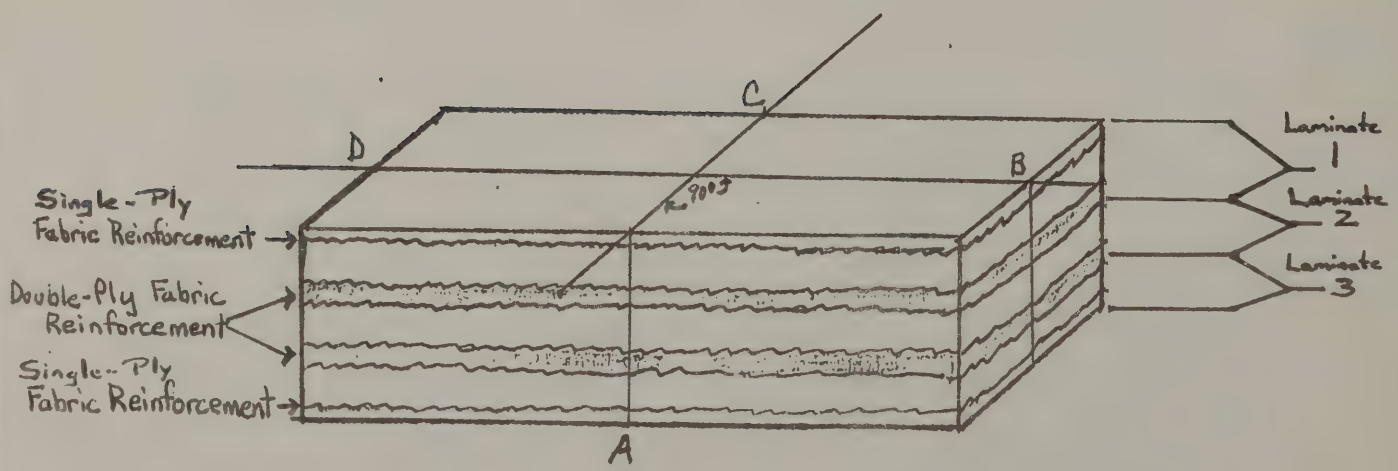
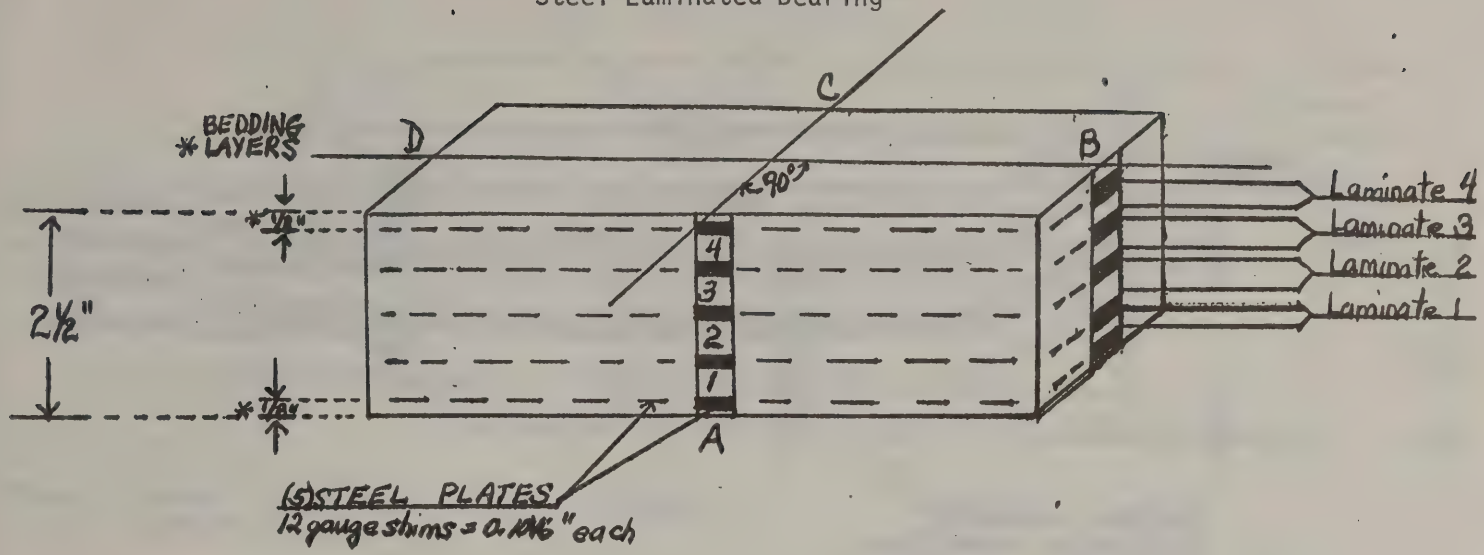


Figure D
Fabric Laminated Elastomeric Bridge Bearing

Completed Inspectors
Worksheet (Examples 1 thru 4)

Steel Laminated Bearing



EXAMPLE 1

Contract No. D250000 Lot No. 6
Shop Drawing No. US-285 Pad No. 9

ERT = 1.73" 75% ERT = 1.30"
Laminate Thickness = ERT/4 = 0.43" Laminate Thickness ± 20% = 0.34" to 0.52"

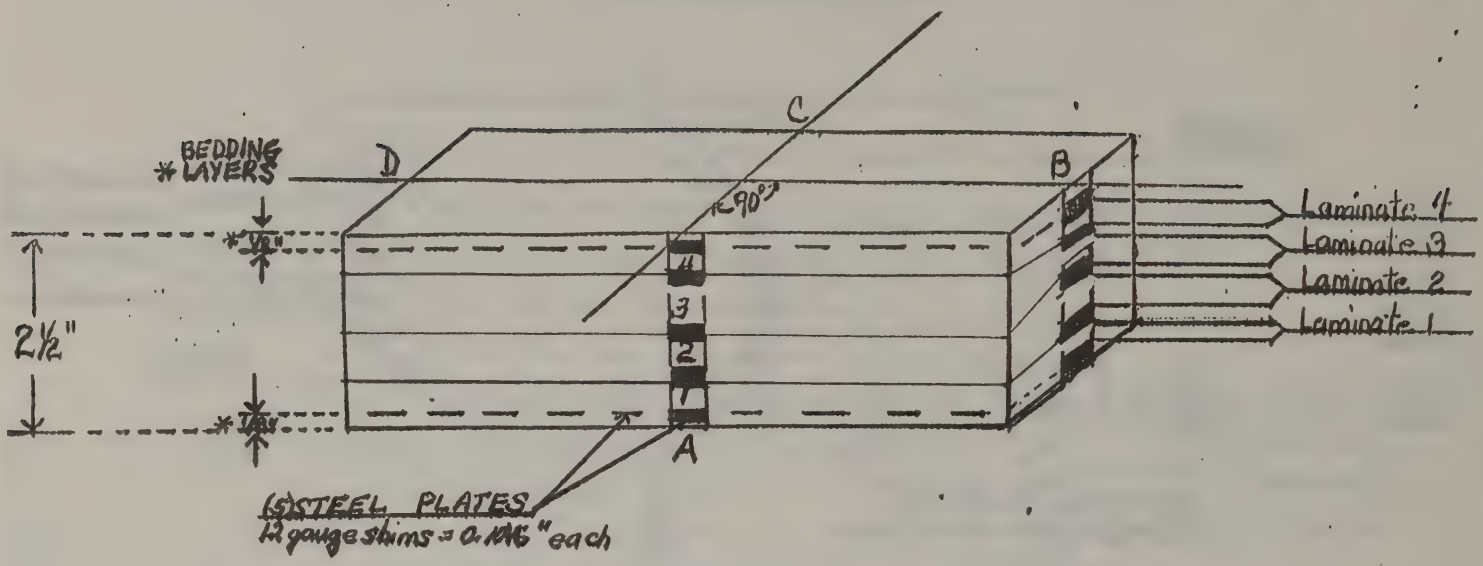
Measurements 0.01"

Laminate	Side A	Side B	Side C	Side D	Working Thickness (Lowest of 4 Sides)	Average of Four Sides
1	0.36	0.37	0.50	0.34	0.34	0.39
2	0.48	0.39	0.42	0.36	0.36	0.41
3	0.35	0.49	0.37	0.48	0.35	0.42
4	0.42	0.35	0.34	0.49	0.34	0.40
					1.39" Total	

The above number exceeds 1.30" (75% ERT). Therefore this bearing has acceptable plate parallelism.

Each of the above recorded measurements are within the tolerance range of 0.34"-0.52". Therefore this bearing has acceptable laminate thickness.

Steel Laminated Bearing



Example 2

Contract No. D250000 Lot No. 6
Shop Drawing No. US-285 Pad No. 3

ERT = 1.73" 75% ERT = 1.30"
Laminate Thickness = ERT/4 = 0.43" Laminate Thickness ± 20% = 0.34" to 0.52"

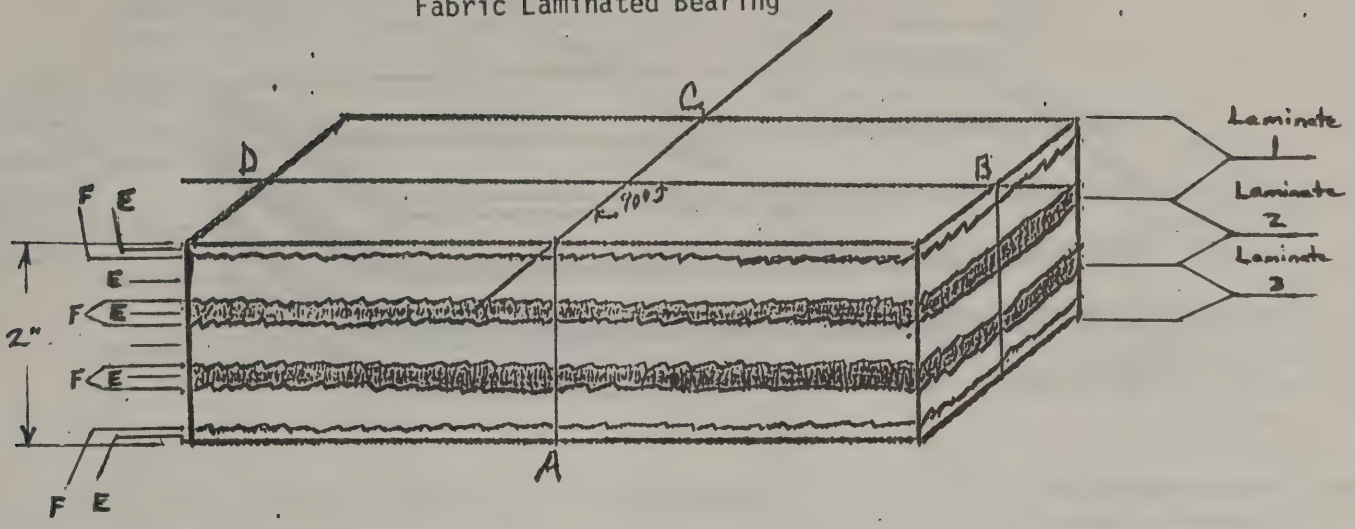
Measurements 0.01"

Laminate	Side A	Side B	Side C	Side D	Working Thickness (Lowest of 4 Sides)	Average of Four Sides
1	0.19	0.47	0.60	0.38	0.19	0.41
2	0.50	0.46	0.35	0.42	0.35	0.43
3	0.34	0.34	0.43	0.37	0.34	0.37
4	0.24	0.42	0.51	0.48	0.24	0.41
					1.12 Total	

The above number is less than 1.30" (75% ERT). Therefore this bearing has unacceptable plate parallelism. The inspector shall notify the Materials Bureau immediately requesting appropriate action.

Each of the above recorded measurements are within the tolerance range of 0.34" – 0.52". Therefore this bearing has acceptable laminate thickness.

Fabric Laminated Bearing



Note: F denotes Fabric
E denotes Elastomer

Example 3

Contract No. D250000 Lot No. 10
Shop Drawing No. 45-243 Pad No. 2

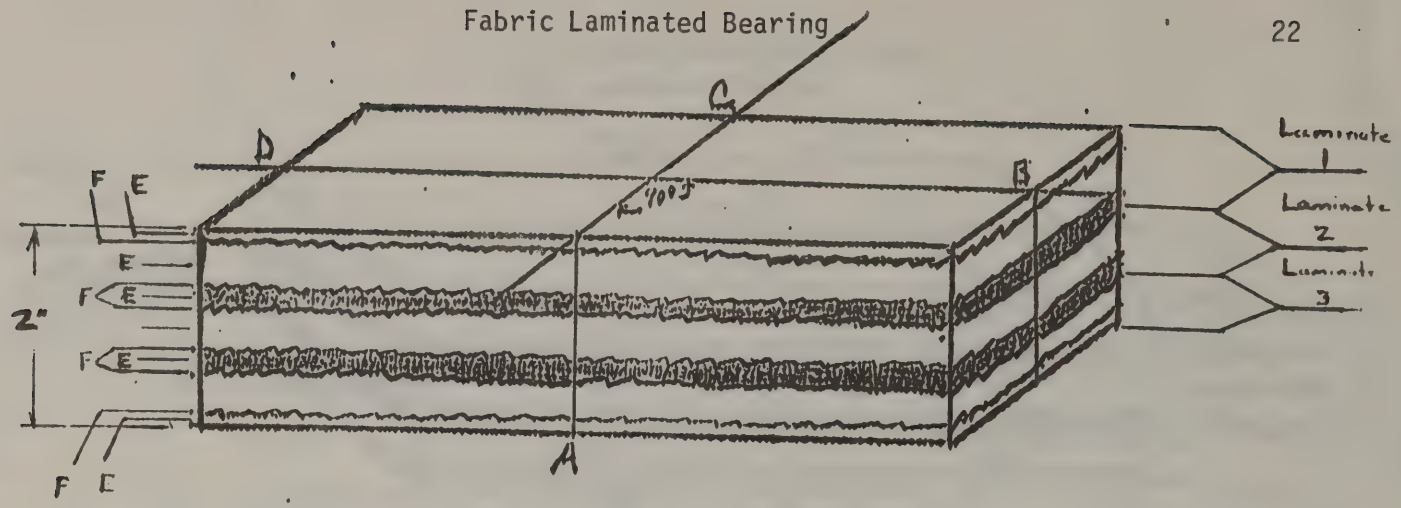
ERT = 2.00" 75% ERT = 1.50"
Laminate Thickness = ERT/3 = 0.67" Laminate Thickness ± 20% = 0.54"- 0.80"

Measurements 0.01"

Laminate	Side A	Side B	Side C	Side D	Working Thickness (Lowest of 4 Sides)	Average of Four Sides
1	0.63	0.69	0.63	0.67	0.63	0.66
2	0.68	0.64	0.68	0.65	0.64	0.66
3	0.65	0.65	0.64	0.65	0.64	0.65
					1.91" Total	

The above number exceeds 1.50" (75% ERT). Therefore this bearing has acceptable Fabric parallelism.

Each of the above recorded measurements are within the tolerance range of 0.54"- 0.80". Therefore this bearing has acceptable laminate thickness.



Note: F denotes Fabric
E denotes Elastomer

Example 4

Contract No. D250000 Lot No. 10
Shop Drawing No. US-243 Pad No. 12

ERT = 2.00" 75% ERT = 1.50"
Laminate Thickness = ERT/ = 0.67" Laminate Thickness ± 20% = 0.54"-0.80"

Measurements 0.01"

Laminate	Side A	Side B	Side C	Side D	Working Thickness (Lowest of 4 Sides)	Average of Four Sides
1	0.35	0.40	0.35	0.40	0.35	0.38
2	0.78	0.80	0.80	0.77	0.77	0.79
3	0.65	0.65	0.67	0.68	0.65	0.66

1.77" Total

The above number 1.50" (75% ERT). Therefore this bearing has acceptable Fabric parallelism.

0.38" is not within the tolerance range of 0.54"- 0.80". The inspector shall notify the Materials Bureau immediately requesting appropriate action.

Inspector's Worksheet

Contract No. _____ Lot No. _____
Shop Drawing No. _____ Pad No. _____

ERT = _____ 75% ERT = _____
Laminate Thickness = ERT/ = _____ Laminate Thickness ± 20% = _____

Measurements 0.01"

Laminate	Side A	Side B	Side C	Side D	Working Thickness (Lowest of 4 Sides)	Average of Four Sides
1						
2						
3						
4						

Contract No. _____ Lot No. _____
Shop Drawing No. _____ Pad No. _____

ERT = _____ 75% ERT = _____
Laminate Thickness = ERT/ = _____ Laminate Thickness ± 20% = _____

Measurements 0.01"

Laminate	Side A	Side B	Side C	Side D	Working Thickness (Lowest of 4 Sides)	Average of Four Sides
1						
2						
3						
4						

Examples of Completed BR240, Sample And Acceptance Transmittal For Plain and Steel Laminated Elastomeric Bridge Bearings

BR-240a (11/74) SAMPLE AND ACCEPTANCE TRANSMITTAL NYSDoT MATERIALS BUREAU

SERIAL NO 56753 | DATE REC'D | TEST NO.

TO:

SAMPLE

'Material Represented by the Sample Described Below Was

ON ____ For

(Action Official Only When Validated Below By The Materials Bureau)

UPPER PORTION FOR MATERIALS BUREAU ONLY — INSPECTOR TO COMPLETE ALL APPLICABLE BOXES BELOW

16 ADDITIONAL INFO (SEE INSTRUCTIONS ON REAR)
Sample Bearings#6,10,14

½"x8"x30"
Drawing #US-123

1 MATERIAL: Plain Elastomeric Bridge Bearings | 2 ITEM NO: 716-02 | 3 DATE SAMPLED: 5/31/84 | 4 CONTRACT NO: D250000

5 SUPPLIER AND LOCATION: U.S. Bearing, New York, NY | 6 QUANTITY IN LOT: 20 | 7 LOT NO: 2

8 MANUFACTURER AND LOCATION (IF DIFFERENT THAN ABOVE): Same | 9 BATCH NO: | 10 DATE OF MFGR: 5/26/84

11 SAMPLED AT: [ ] MILL [X] PLANT [ ] JOB

12 TYPE: [X] CONTROL SAMPLE [ ] INFO. SAMPLE [ ] BPR SAMPLE [ ] APPROVED LIST MAT [ ] CERTIFIED MAT

13 SAMPLED FROM: U.S. Bearing

14 SAMPLED BY (INCL DIST NO OR AGENCY): A. Smith, B.B. Insp.

15 CONTRACTOR AND PROJECT LOCATION

MATERIALS BUREAU VALIDATION

RETAIN PINK COPY FOR YOUR RECORDS
FORWARD ALL OTHERS TO MATERIALS BUREAU

Figure E

BR-240a (11/74) SAMPLE AND ACCEPTANCE TRANSMITTAL NYSDoT MATERIALS BUREAU

SERIAL NO 56754 | DATE REC'D | TEST NO.

TO:

SAMPLE

'Material Represented by the Sample Described Below Was

ON ____ For

(Action Official Only When Validated Below By The Materials Bureau)

UPPER PORTION FOR MATERIALS BUREAU ONLY — INSPECTOR TO COMPLETE ALL APPLICABLE BOXES BELOW

16 ADDITIONAL INFO (SEE INSTRUCTIONS ON REAR)
Sample Bearings#3,9,12,14

4"x12"x24"
Drawing #US-122

Certifications for Steel attached

1 MATERIAL: Steel laminated Elastomeric bridge bearing | 2 ITEM NO: 716-04 | 3 DATE SAMPLED: 5/31/84 | 4 CONTRACT NO: D250000

5 SUPPLIER AND LOCATION: U.S. Bearing, New York, NY | 6 QUANTITY IN LOT: 16 | 7 LOT NO: 1

8 MANUFACTURER AND LOCATION (IF DIFFERENT THAN ABOVE): Same | 9 BATCH NO: | 10 DATE OF MFGR: 5/26/84

11 SAMPLED AT: [ ] MILL [X] PLANT [ ] JOB

12 TYPE: [X] CONTROL SAMPLE [ ] INFO. SAMPLE [ ] BPR SAMPLE [ ] APPROVED LIST MAT [ ] CERTIFIED MAT

13 SAMPLED FROM: U.S. Bearing

14 SAMPLED BY (INCL DIST NO OR AGENCY): A. Smith, B.B. Insp.

15 CONTRACTOR AND PROJECT LOCATION

MATERIALS BUREAU VALIDATION

RETAIN PINK COPY FOR YOUR RECORDS
FORWARD ALL OTHERS TO MATERIALS BUREAU

Figure F

Examples of Completed BR-240, Sample and Acceptance Transmittal For Sliding and Fabric Laminated Elastomeric Bridge Bearings

BR-240a (11/74) SAMPLE AND ACCEPTANCE TRANSMITTAL
NYSDoT MATERIALS BUREAU

SERIAL NO | DATE REC'D | TEST NO

TO:

SAMPLE

'Material Represented by the Sample Described Below Was

ON ____ ____ For

(Action Official Only When Validated Below By The Materials Bureau)

UPPER PORTION FOR MATERIALS BUREAU ONLY — INSPECTOR TO COMPLETE ALL APPLICABLE BOXES BELOW

16 ADDITIONAL INFO (SEE INSTRUCTIONS ON REAR)
Sample Bearings #2,5,9,17

Elastomer-10"x15" sheet attached identified as lot #3 Serial No. 56755

PTFE-10"x15" sheet, 1/16" thick, Unfilled, attached identified as lot #3, Serial No. 56755
Certifications attached

RETAIN PINK COPY FOR YOUR RECORDS
FORWARD ALL OTHERS TO MATERIALS BUREAU

1 MATERIAL	2 ITEM NO	3 DATE SAMPLED	4 CONTRACT NO
Elastomeric Sliding Bridge Bearings	716-08	5/31/84	D250000

5 SUPPLIER AND LOCATION	6 QUANTITY IN LOT	7 LOT NO
U.S. Bearing, New York, NY	17	3

8 MANUFACTURER AND LOCATION (IF DIFFERENT THAN ABOVE)	9 BATCH NO	10 DATE OF MFGR
PTFE Corp. of America (PTFE only)		5/26/84

11 SAMPLED AT: [ ] MILL [X] PLANT [ ] JOB

12 TYPE: [X] CONTROL SAMPLE [ ] INFO SAMPLE [ ] BPR SAMPLE [ ] APPROVED LIST MAT [ ] CERTIFIED MAT

13 SAMPLED FROM: U.S. Bearing

14 SAMPLED BY (INCL DIST NO OR AGENCY): A. Smith, B.B. Insp.

15 CONTRACTOR AND PROJECT LOCATION

MATERIALS BUREAU VALIDATION

Figure G

BR-240a (11/74) SAMPLE AND ACCEPTANCE TRANSMITTAL
NYSDoT MATERIALS BUREAU

SERIAL NO | DATE REC'D | TEST NO

TO:

SAMPLE

'Material Represented by the Sample Described Below Was

ON ____ ____ For

(Action Official Only When Validated Below By The Materials Bureau)

UPPER PORTION FOR MATERIALS BUREAU ONLY — INSPECTOR TO COMPLETE ALL APPLICABLE BOXES BELOW

16 ADDITIONAL INFO (SEE INSTRUCTIONS ON REAR)
Sample Bearings#2,5,7,9,20

4"x12"x24"
Drawing #US-125

RETAIN PINK COPY FOR YOUR RECORDS
FORWARD ALL OTHERS TO MATERIALS BUREAU

1 MATERIAL	2 ITEM NO	3 DATE SAMPLED	4 CONTRACT NO
Fabric Laminated Elastomeric Bridge Bearings	716-10	5/31/84	D250000

5 SUPPLIER AND LOCATION	6 QUANTITY IN LOT	7 LOT NO
U.S. Bearing, New York, NY	21	4

8 MANUFACTURER AND LOCATION (IF DIFFERENT THAN ABOVE)	9 BATCH NO	10 DATE OF MFGR
same		5/26/84

11 SAMPLED AT: [ ] MILL [X] PLANT [ ] JOB

12 TYPE: [X] CONTROL SAMPLE [ ] INFO SAMPLE [ ] BPR SAMPLE [ ] APPROVED LIST MAT [ ] CERTIFIED MAT

13 SAMPLED FROM: U.S. Bearings

14 SAMPLED BY (INCL DIST NO OR AGENCY): A. Smith, B.B. Insp.

15 CONTRACTOR AND PROJECT LOCATION

MATERIALS BUREAU VALIDATION

Figure H

Example of Completed BR195,
Shipment Authorization Form

BR 195 (2/68)

SHIPMENT AUTHORIZATION

TO: DISTRICT ENGINEER
DIST. # ☐
(MAIN OFFICE USE ONLY)

NEW YORK STATE
DEPARTMENT OF TRANSPORTATION
MATERIALS BUREAU

Plant Shipment [X]
Transfer Sh'pt ☐
(CHECK ONE)

ACCEPTANCE DATA ON FILE WITH INSPECTOR

MATERIAL	VEHICLE NO.	SHIPMENT DATE	CONTRACT NO.
716-02 Plain Elasto-meric Bridge Bearings	12345	6/29/84	D250000

SHIPMENT DESTINATION (CONTRACTOR'S NAME AND COUNTY)
A. J. Contracting, Allegany

SUPPLIER'S NAME AND LOCATION
U. S. Bearing - New York, NY

ITEM NO.	TEST NO. AND/OR ACCEPTANCE DATE	LOT NO.	DIAM.	GAUGE	QUANTITY AND UNIT
716-02	84MS100 - 6/27/84	2			17 of 20

SAMPLE

OTHER INFORMATION

SHIPPED BY (INSPECTOR'S NAME)
A. Smith, B.B. Insp.

DIST. NO. OR AGENCY

MATERIALS BUREAU VALIDATION

Figure I

INSTRUCTIONS:

1. Determine number of digits to be used that correspond with number of units to be sampled. (e.g. 500 units - use last three digits of each number in the table - 9685)

2. Starting anywhere in the table, select the units to be sampled by reading the numbers consectively that do not exceed total number of units in the lot.

(EXAMPLE - 500 units to be sampled with 5 samples needed. Presume you start on line 27, column 3 (#685). Since 685 is larger than the number of units in lot, go down col. 3 selecting numbers 64, 32, 187, 37 and 110. When counting units in lot, those units corresponding to these numbers would be sampled.)

RANDOM NUMBER TABLE

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1.	1306	1189	5731	3968	5606	5084	8947	3897	1636	7810
2.	0422	2431	0649	8085	5053	4722	6598	5044	9040	5121
3.	6597	2022	6168	5060	8656	6733	6364	7649	1871	4328
4.	7965	6541	5645	6243	7658	6903	9911	5740	7824	8520
5.	7695	6937	0406	8894	0441	8135	9797	7285	5905	9539
6.	5160	7851	8464	6789	3938	4197	6511	0407	9239	2232
7.	2961	0551	0539	8288	7478	7565	5581	5771	5442	8761
8.	1428	4183	4312	5445	4854	9157	9158	5218	1464	3634
9.	3666	5642	4539	1561	7849	7520	2547	0756	1206	2033
10.	6543	6799	7454	9052	6689	1946	2574	9386	0304	7945
11.	9975	3080	7423	3175	9377	6951	6591	8287	8994	5532
12.	4866	0956	7545	7723	8085	4948	2228	9583	4415	7065
13.	8239	7068	6694	5168	3117	1586	0237	5160	9585	1133
14.	8722	9191	3386	3443	0434	4586	4150	1224	6204	0937
15.	1330	9120	8785	8382	2929	7089	3109	6742	2468	7025
16.	2296	2952	4764	9070	6356	9192	4012	0618	2219	1109
17.	3582	7052	3132	4519	9250	2486	0830	8472	2160	7046
18.	5872	9207	7222	6494	8973	3545	6967	8490	5264	9821
19.	1134	6324	6201	3792	5651	0538	4676	2064	0584	7996
20.	1403	4497	7390	8503	8239	4236	8022	2914	4368	4529
21.	3393	7025	3381	3553	2128	1021	8353	6413	5161	8555
22.	1137	7896	3602	0060	7850	7626	0854	6565	4260	6220
23.	7437	5198	8772	6927	8527	6851	2709	5992	7383	1071
24.	8414	8820	3917	7238	9821	6073	6658	1280	9643	7761
25.	8398	5224	2749	7311	5740	9771	7826	9533	3800	4553
26.	0995	8935	2939	3092	2496	0359	0318	4697	7181	4035
27.	6657	0755	9685	4017	6581	7292	5643	5064	1142	1297
28.	8875	8369	7868	0190	9278	1709	4253	9346	4335	3769
29.	8399	6702	0586	6428	7985	2979	4513	1970	1989	3105
30.	6703	1024	2064	0393	6815	8502	1375	4171	6970	1201
31.	4730	1653	9032	9855	0957	7366	0325	5178	7959	5371
32.	8400	6834	3187	8688	1079	1480	6776	9888	7585	9998
33.	3647	8002	6726	0877	4552	3238	7542	7804	3933	9475
34.	6789	5197	8037	2354	9262	5497	0005	3986	1767	7981
35.	2630	2721	2810	2185	6323	5679	4931	8336	6662	3566
36.	1374	8625	1644	3342	1587	0762	6057	8011	2666	3759
37.	1572	7625	9110	4409	0239	7059	3415	5537	2250	7292
38.	9678	2877	7579	4935	0449	8119	6969	5383	1717	6719
39.	0882	6781	3538	4090	3092	2365	6001	3446	9985	6007
40.	0006	4205	2389	4365	1981	8158	7784	6256	3842	5603
41.	4611	9861	7916	9305	2074	9462	0254	4827	9198	3974
42.	1093	3784	4190	6332	1175	8599	9735	8584	6581	7194
43.	3374	3545	6865	8819	3342	1676	2264	6014	5012	2458
44.	3650	9676	1436	4374	4716	5548	8276	6235	6742	2154
45.	7292	5749	7977	7602	9205	3599	3880	9537	4423	2330
46.	2353	8319	2850	4026	3027	1708	3518	7034	7132	6903
47.	1094	2009	8919	5676	7283	4982	9642	7235	8167	3366
48.	0568	4002	0587	7165	1094	2006	7471	0940	4366	9554
49.	5606	4070	5233	4339	6543	6695	5799	5821	3953	9458
50.	8285	7537	1181	2300	5294	6892	1627	3372	1952	3028

From D. B. Owen's Handbook of Statistical Tables, 1962, Addison-Wesley, Reading, Mass., courtesy of the U. S. Atomic Energy Commission.

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